ADJUSTABLE SCISSORS-ACTION EXERCISER

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to exercising apparatuses and more particularly, to an adjustable scissors-action exerciser.

2. Description of the Related Art

A conventional scissors-action exerciser is known comprised of two pivoted motion arms and a damper (normally a spring) connected between the two motion arms. When pressing the motion arms toward each other, the damper imparts a damping resistance to the motion arms, and therefore the muscle of the user's arms, hands, or legs are exercised. However, the scissors-action exerciser is structurally not adjustable, i.e. the user cannot adjust the operation angle of the motion arms. Because the operation angle of the motion arms is fixed, it does not fit different users. If the operation angle of this design of the scissors-action exerciser is too large for one user, the user will not conveniently apply force to the motion arms, such that the inaccurate operation posture may be caused to further incur harm to the muscle. If the operation angle of this design of the scissors-action exerciser is too small for the user, the user will fail to achieve the desired exercising effect.

SUMMARY OF THE INVENTION

The present invention has been accomplished under the circumstances in view. It is one object of the present invention to provide an adjustable scissors-action exerciser, which allows the user to adjust its operation angle subject to individual operation requirement. It is another object of the present invention to provide an

adjustable scissors-action exerciser, which is structurally simple and easy for operation.

To achieve the foregoing objects of the present invention, the adjustable scissors-action exerciser includes a first motion arm having a coupling end, a coupling block pivotally coupled to the coupling end and having a protruding rod, a damper provided between the first motion arm and the coupling block for generating damping resistance upon rotation of the coupling block in one direction relatively to the first motion arm, a second motion arm having a coupling end pivotally coupled to the coupling block, a plurality of chisel grooves formed in the coupling end and smoothly curvely arranged in parallel, a first protrusion, and a second protrusion, the chisel grooves each having a sloping face and a stop face asymmetric to the stop face, the sloping faces of the chisel grooves sloping in counterclockwise direction, a locking member having a middle part pivoted to the coupling block, an engagement portion at an end thereof, and a stop portion at an opposite end thereof, a first spring member connected between the locking member and the coupling block and adapted to reverse the locking member after the locking member being pressed, a limiter having a middle part pivoted to the coupling block, a first end, and a second end, and a second spring member connected between the limiter and the coupling block for reversing the limiter after the limiter is pressed.

When the first motion arm and the second motion arm are put together, the engagement portion of the locking member is engaged into one of the chisel grooves of the second motion arm, the stop portion of the locking member is stopped at the protruding rod of the coupling block, and the first end of the limiter is stopped at an outside of the stop portion.

When turning the second motion arm in counterclockwise direction

relatively to the coupling block to expand the contained angle between the first motion arm and the second motion arm, the engagement portion of the locking member is moved over the sloping face of the respective chisel groove and then forced by the first spring member into engagement with a next chisel groove.

When turning the second motion arm in clockwise direction relatively to the coupling block to reduce the contained angle between the first motion arm and the second motion arm, the engagement portion of the locking member is stopped against the stop face of the respective chisel groove, thereby causing the second motion arm to move the coupling block relatively to the first motion arm.

When the contained angle between the first motion arm and the second motion arm surpassed a predetermined angle, the engagement portion is forced by the first protrusion to reverse the locking member, thereby causing the stop portion of the locking member to move over the first end of the limiter and then to press on the first end of the limiter against the projecting rod, and the second end of the limiter is disposed in a position touchable by the second protrusion and the engagement portion of the locking member is kept away from the chisel grooves, at this time the second motion arm can be turned clockwise relatively to the first motion arm till that the second end of the limiter is stopped at the second protrusion to force the first end of the limiter to move over the stop portion of the locking member and then to press on the stop portion of the locking member against the protruding rod, causing the locking member to engage the engagement portion into the chisel grooves.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded view of an adjustable scissors-action exerciser according to a preferred embodiment of the present invention.

FIG. 2 is a perspective view of the adjustable scissors-action exerciser

according the preferred embodiment of to the present invention.

FIG. 3 is an enlarged top view of a damper of the adjustable scissors-action exerciser according to the preferred embodiment of the present invention.

FIG. 4 is an enlarged bottom view of a coupling block of the adjustable scissors-action exerciser according to the preferred embodiment of the present invention.

FIG. 5 is a schematic view of the adjustable scissors-action exerciser according to the preferred embodiment of the present invention, showing the relationship between a locking member and chisel grooves when two motion arms are in a collapsed position.

FIG. 6 similar to FIG. 5, showing the relationship between the locking member and a limiter when a second motion arm is turned outwards relatively to a first motion arm.

FIG. 7 is similar to FIG. 6, showing that the locking member is engaged into one of the chisel grooves.

FIG. 8 is similar to FIG. 7, showing that the relationship between the locking member and the limiter when the locking member is stopped at a first protrusion.

FIG. 9 is similar to FIG. 8, showing that a stop portion of the locking member is forced by a first spring member to press a first end of the limiter.

FIG. 10 is similar to FIG. 9, showing that the second motion arm is turned counterclockwise relatively to the first motion arm.

FIG. 11 is similar to FIG. 10, showing the relationship between the locking member and the limiter when a second end of the limiter is stopped at a second protrusion.

DETAILED DESCRIPTION OF THE INVENTION

Referring to FIG. 1 and 5, an adjustable scissors-action exerciser is shown comprised of a first motion arm **10**, a coupling block **20**, a damper **30**, a locking member **40**, a first spring member **50**, a limiter **60**, a second spring member **70**, a second motion arm **80**, and two baffles **90**.

Referring to FIG. 1 and 3, the first motion arm **10** includes a main shaft **11** and an extension shaft **12**. The main shaft **11** includes a recessed circular open chamber **111** formed at an end thereof defining a coupling end **13**, a pivot **112** extended outwardly from a center of the circular open chamber **111**, a reference point **131** protruded from an outside wall of the coupling end **13**, a locating groove **113** formed at an inside wall of the coupling end **13** inside the recessed circular open chamber **11**, a longitudinal sliding chamber **114** axially inwardly extended from the other end thereof, and three locating holes **115** perpendicularly outwardly extended from the longitudinal sliding chamber **114** to an outside of the main shaft **11** and longitudinally arranged at an equal interval (only one locating hole **115** is shown in FIG. 1). The extension shaft **12** is an elongated plate, having a spring retainer **121** at an end thereof and a pivot hole **122** at the other end thereof. The extension shaft **12** is axially slidably mounted into the longitudinal sliding chamber **114** and selectively locked to one of the locating holes **115** of the main shaft **11** by the spring retainer **121** for adjusting the length of the first motion arm 10.

Referring to FIGS. 4 and 5, the coupling block **20** is a barrel-like block fitting the diameter of the circular open chamber **111** of the main shaft **11** of the first motion arm **10**, having a protruding rod **21** at a predetermined position of an outside thereof (see FIG. 5), a locating groove **22** formed at a side along an inner diameter thereof, and a pivot hole **23** axially formed at an center thereof and communicating

inside and outside (see FIG. 4). By means of the pivot hole **23**, the coupling block **20** is pivotally coupled to the pivot **112** of the first motion arm **10** and received in the circular open chamber **111** with an opening thereof facing downwards. Thus, the coupling block **20** can be rotatable relatively to the first motion arm **10**.

The damper **30** according to the present preferred embodiment is a torsional spring set between the circular open chamber **111** of the first motion arm **10** and the coupling block **20**, having an end fastened to the locating groove **113** of the first motion arm **10** and the other end fastened to the locating groove **22** of the coupling block **20**. When the coupling block **20** pivots relatively to the first motion arm **20**, the damper **30** is deformed to generate a return force that forces the coupling block **20** to pivotally return to the original position.

Referring to FIG. 5, the locking member **40** is an elongated member having an engagement portion **41** disposed at an end, a stop portion **42** disposed at the other end, and a pivot **43** disposed at a midsection thereof and pivotally coupled to a predetermined position of an outside of the coupling block **20**.

The first spring member **50** is a torsional spring coupled to the pivot **43** of the locking member **40**, having an end fastened to the engagement portion **41** of the locking member **40** and the other end fastened to the coupling member **20**. By means of the first spring member **50**, the locking member **40** has power of forward rotation (clockwise direction in FIG. 5) to return to the original position. Normally, the first spring member **50** forces an inner side of the stop portion **42** of the locking member **40** to be stopped against the protruding rod **21** of the coupling member **20**.

The limiter **60** is an elongated member having a first end **61**, a second end **62**, and a pivot **63** pivotally mounted near a midsection thereof for fastening the limiter **60** to another predetermined position of the outside of the coupling block **20**.

The second spring member **70** is a torsional spring coupled to the pivot **63** of the limiter **60**, having an end fastened to the first end **61** of the limiter **60** and the other end fastened to the coupling block **20**. By means of the second spring member **70**, the limiter **60** has power of backward rotation (counterclockwise direction in FIG. 5) to return to the original position. Normally, the second spring member **70** forces an inner side of the first end **61** the limiter **60** to be stopped against the stop portion **42** of the locking member **40**.

Referring to FIGS. 1 and 5, the second motion arm **80** has a configuration substantially similar to the first motion arm **10** with the exception that the coupling end **82** of the main shaft **81** is provided with a socket **821** (see FIG. 1). The socket **821** has on the inside 6 chisel grooves **822**, a first protrusion **823**, and a second protrusion **824** (FIG. 5). The chisel grooves **822** are smoothly curvely arranged in parallel, each having a sloping face **825** and a stop face **826**. The sloping faces **825** of the chisel grooves **822** slope in one direction (counterclockwise direction in FIG. 5) and the stop faces **826** are respectively connected between inner and outer ends of each two adjacent sloping faces **825**, and therefore each of the chisel grooves **822** is acute in shape. Further, peaks of each two adjacent chisel grooves **822** are spaced at an angle of substantially 15°, such that the chisel grooves **822** are disposed in the socket **821** within an angle of substantially 90°. The first protrusion **823** is disposed adjacent to a side of the last forwardly spirally extended chisel groove **822**, and protruded from an inside wall of the socket **821** toward a central axis of the socket **821** for a predetermined thickness. The second protrusion **824** is protruded from an inside wall of the socket **821** toward the central axis of the socket **821** for a predetermined thickness. The second protrusion **824**, the first protrusion **823**, and the chisel grooves **822** are spaced from one another at a predetermined angle. Further, the coupling end **82** is provided

with six marks **827** at an outer periphery thereof opposite the chisel grooves **822**, and a center pivot hole **828** extended through the axial center of the socket **821**. The six marks **827** are equally spaced from one another at angle of substantially 15°.

By means of the pivot hole **828**, the second motion arm **80** is pivotally coupled to the pivot **112** of the first motion arm **10**, the socket **821** is pivotally capped on the coupling block **20** and the engagement portion **41** of the locking member **40** is inserted into one of the chisel grooves **822**. In the meantime, the reference point **131** of the first motion arm **10** is aligned with one of the marks **827** of the second motion arm **80**, and a locating member **829** is inserted through the pivot hole **828** and the pivot **112** to prevent disconnection between the two motion arms **10** and **80** during exercise.

Referring to FIG. 1 again, the two baffles **90** are oval plates each having a vertically mounting hole **91** running therethrough. Each of two bolts **92** is threadedly mounted between the mounting hole **91** and the pivot hole **122** of the first arm **10** (the second arm **80**). When installed, the two baffles **90** are disposed respectively at outsides of the first and second motion arms **10** and **80**.

Referring to FIGS. 5~7, when the engagement portion **41** of the locking member **40** is inserted into the foremost chisel groove **822** and the reference point **131** of the first motion arm **10** is aligned with the foremost mark **827** of the second motion arm **80**, the first and second motion arms **10** and **80** are at a collapsed position. (see FIG. 5) When in use, the second motion arm **80** is turned outwards from the first motion arm **10** (i.e. the second motion arm **80** is turned in one direction relatively to the coupling block **20**) to move the engagement portion **41** of the locking member **40** over the sloping face **825** of the first one of the chisel grooves **822** (see FIG. 6), for enabling the engagement portion **41** of the locking member **40** to be forced by the first spring member **50** into engagement with the next (second) one of the chisel grooves

822 (see FIG. 7). By means of this operation procedure, a contained angle between the two motion arms **10** and **80** can be selectively adjusted to one of six different angles subject to the user's requirement.

Referring to FIG. 7 again, when operating the two motion arms **10** and **80**, the user's two arms or legs are respectively pressed on the baffles **90** of the motion arms **10** and **80**, and then move the motion arms **10** and **80** alternately inwards and outwards with the arms or legs. At this time, the engagement portion **41** of the locking member **40** will be stopped at the stop face **826** of the respective chisel groove **822**, and the second motion arm **80** will drive the coupling block **20** to pivot relatively to the first motion arm **10**. During exercise, the motion arms **10** and **80** compress the damper **30** to cause the damper **30** to generate a damping resistance, against which the user can exercises, and therefore the user's muscle are trained.

Referring to FIGS. 8 and 9, when the angle between the first and second motion arms **10** and **80** are excessively big or when the user intends to collapse the scissors-action exerciser, the user can unfold the second motion arm **80** further to let the engagement portion **41** of the locking member **40** be stopped at the first protrusion **823** (see FIG. 8) to cause the stop portion **42** of the locking member **40** to move over the first end **61** of the limiter **60** and then to press on outside of the first end **61** of the limiter **60** and to force the inner side of the first end **61** of the limiter **60** against the projecting rod **21**, and meanwhile, the second end **62** of the limiter **60** is disposed in a position touchable by the second protrusion **824** (see FIG. 9) and the engagement portion **41** of the locking member **40** is kept away from the chisel grooves **822**. Thus, the second motion arm **80** can freely be pivotable relatively to the first motion arm **10** and the coupling block **20**.

Referring to FIGS. 10 and 11 and FIG. 5 again, at this time, the user can turn

the second motion arm **80** inwards toward the first motion arm **10** (see FIG. 10) to the extent that the second end **62** of the limiter **60** is stopped at the second protrusion **824**. At this time, the limiter **60** slightly pivots to move the first end **61** over the stop portion **42** of the locking member **40**, thereby causing the first end **61** to press on the outside of the stop portion **42** of the locking member **40** against projecting rod **21** (see FIG. 11), and the engagement portion **41** of the locking member **40** is forced into engagement with the foremost the chisel grooves **822** to lock the two motion arms **10** and **80** at the collapsed position (see FIG. 5). Therefore, the user can adjust the desired operation angle again.

As indicated above, the scissors-action exerciser allows the user to adjust the contained angle between the motion arms **10** and **80** for operation comfortably. Further, subject to the alignment between the reference point **131** and the marks **827**, the user knows the set angle between the motion arms **10** and **80**. Further, the user can adjust the length of the motion arms **10** and **80**, i.e. the extending status of the extension shafts **12** of the motion arm **10** and **80**. This scissors-action exerciser is ergonomic to be practical in use. The baffles **90** of the motion arms **10** and **80** give a comfort touch to the user, and provide a broad area for receiving the force applied from the user.

Further, the simple structural design of the scissors-action exerciser is practical for exercising the arms and the legs through a scissors action. The invention can also be miniaturized for use in other exercise apparatuses like handgrips.